Part (1) : Medians Of Triangle

Mechanism (1) : Median

Definition

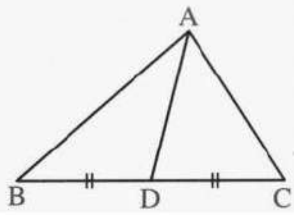
The median of the triangle is the line segment drawn from any vertex of the triangle vertices to the midpoint of the opposite side of this vertex.

For example :

In the opposite figure :

$\because$ D is the midpoint of $\overline{BC}$

$\therefore$ $\overline{AD}$ is the median of Δ ABC



Mechanism (2) : Point of Concurrence

Theorem (2)

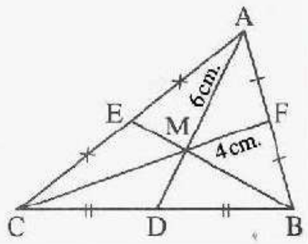
The point of concurrence of the medians of the triangle divides each median in the ratio of 1 : 2 from its base.

For example :

In the opposite figure :

In Δ ABC , M is the point of intersection of its medians , then:

1. MD = $\frac{1}{2}$ AM IF AM = 6 cm. , then MD = 3 cm.
2. CM = 2 FM IF FM = 4 cm. , then CM = 8 cm.



Mechanism (3) : Median – Right-Angled Triangle :

Theorem (3)

In the right-angled triangle , the length of the median from the vertex of the right angle equals half the length of the hypotenuse.

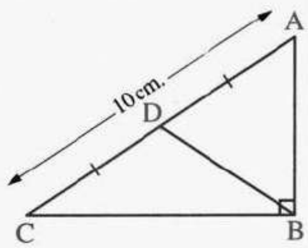
For example :

In the opposite figure :

Δ ABC is a right-angled triangle at B ,

D is the midpoint of $\overline{AC}$ and AC = 10 cm. ,

then DB = 5 cm.



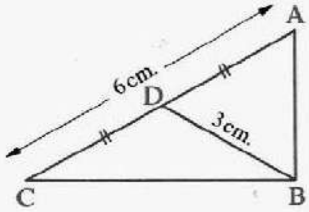
Mechanism (4) : Median – To prove angle is right in Triangle

The converse of theorem (3)

If the length of the median drawn from a vertex of a triangle equals half the length of the opposite side to this vertex, then the angle at this vertex is right.

For example :

In the opposite figure :



If $\overline{BD}$ is a median in Δ ABC ,

BD = 3 cm. and AC = 6 cm. ,

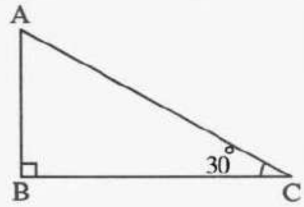
then m ($\angle$ ABC) = 90° "because : BD = $\frac{1}{2}$ AC "

Mechanism (5) : Median – Right – 30° - 60°

Corollary

The length of the side opposite to the angle of measure 30° in the right-angled triangle equals half the length of the hypotenuse.

In the opposite figure :



If Δ ABC is a right-angled at B and

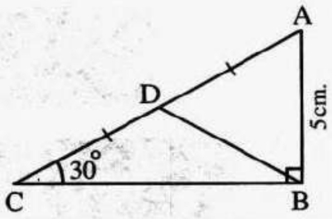
m ($\angle$ C) = 30° , then AB = $\frac{1}{2}$ AC

For example :

If AC = 20 cm. , then AB = 10 cm.

Examples on Part (1) : Medians Of Triangle

(1) **In the opposite figure :**



m ($\angle$ B) = 90° and m ($\angle$ C) = 30°

, AB = 5 cm,

Find the length of : $\overline{AC}$ and $\overline{BD}$

Solution

In Δ ABC

$\because$ m ($\angle$B) = 90°

$\because$ m ($\angle$C) = 30°

$\therefore$ AC = 2 AB = 2 × 5 = 10 cm

(First Req.)

$\because$ D is a midpoint of $\overline{AC}$

$\therefore$ $\overline{BD}$ is a median

$\therefore$ BD = $\frac{1}{2}$ AC = $\frac{1}{2}$ × 10 = 5 cm

(Second Req.)

(2) **In the opposite figure :**

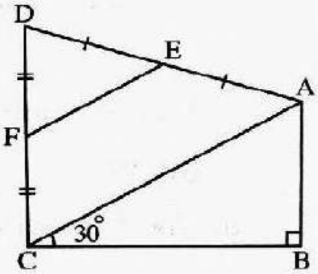
$m(\angle B) = 90°$

, $m(\angle ACB) = 30°$

, E is the midpoint of $\overline{AD}$

, F is the midpoint of $\overline{CD}$

Prove that : $AB = EF$



Solution

In Δ ABC

$\because m(\angle B) = 90°$

$\because m(\angle C) = 30°$

$\therefore BD = \frac{1}{2} AC$ - - - - - - (1)

In Δ ADC

$\because$ E is a midpoint of $\overline{AD}$

$\because$ F is a midpoint of $\overline{DC}$

$\therefore EF = \frac{1}{2} AC$ - - - - - - (2)

From (1) ad (2)

$\therefore AB = EF$

---

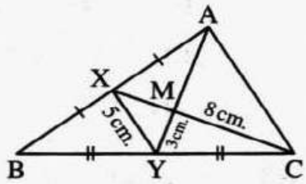
(3) **In the opposite figure :**

ABC is a triangle , X is the midpoint of $\overline{AB}$

, Y is the midpoint of $\overline{BC}$, $\overline{XC} \cap \overline{AY} = \{M\}$

, XY = 5 cm. , CM = 8 cm. , YM = 3 cm.

Find the perimeter of : Δ MAC



Solution

In Δ ABC

$\because$ Y is a midpoint of $\overline{BC}$

$\because$ X is a midpoint of $\overline{AB}$

$\therefore AC = 2\,XY = 2 \times 5 = 10$ cm

$\because$ Y is a midpoint of $\overline{BC}$

$\therefore \overline{AY}$ is a median In Δ ABC

$\because$ X is a midpoint of $\overline{AB}$

$\therefore \overline{CX}$ is a median In Δ ABC

$\therefore$ M is the intersection point of medians In Δ ABC

$\therefore AM = 2\,MY = 2 \times 3 = 6$ cm

The perimeter of Δ MAC =

$6 + 8 + 10 = 24$ cm

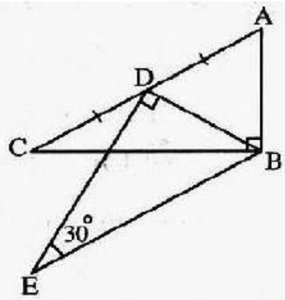
(4) **In the opposite figure :**

$m(\angle ABC) = m(\angle BDE) = 90°$

, $m(\angle E) = 30°$

, D is the midpoint of $\overline{AC}$

Prove that : $AC = BE$



Solution

In Δ ABC

$\because m(\angle B) = 90°$

$\because$ D is a midpoint of $\overline{AC}$

$\therefore \overline{BD}$ is a median

$\therefore BD = \frac{1}{2} AC$ - - - - - - (1)

In Δ DBE

$\because$ m ($\angle$BDE) = 90°

$\because$ m ($\angle$E) = 30°

$\therefore$ BD = $\frac{1}{2}$ BE - - - - - - (2)

From (1) ad (2)

$\therefore$ AC = BE

---

(5) **In the opposite figure :**

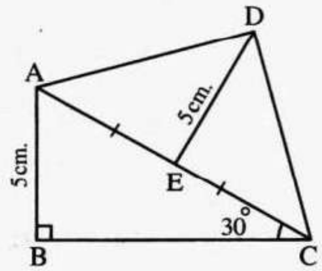
ABC is a right-angled triangle at B

, m ($\angle$ ACB) = 30° , AB = 5 cm.

, E is the midpoint of $\overline{AC}$

If DE = 5 cm.

Prove that : m ($\angle$ ADC) = 90°



Solution

In Δ ABC

$\because$ m ($\angle$B) = 90°

$\because$ m ($\angle$BCA) = 30°

$\therefore$ AB = $\frac{1}{2}$ AC

$\because$ AB = 5 cm

AC = 5 × 2 = 10 cm

In Δ ADC

$\because$ E is a midpoint of $\overline{AC}$

$\therefore$ $\overline{ED}$ is a median

$\because$ DE = 5 cm

$\therefore$ DE = $\frac{1}{2}$ AC

$\therefore$ m ($\angle$ADC) = 90°

🕮 🕮 🕮 Part (2) : Isosceles Triangle 🕮 🕮 🕮

🕮 Mechanism (6) : Isosceles Triangle :

Theorem (1)

The base angles of the isosceles triangle are congruent.

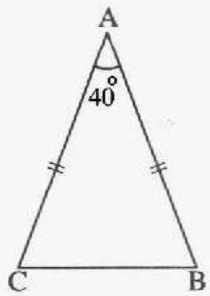
For example :

In the opposite figure :

If ABC is a triangle in which :

AB = AC , m ($\angle$ A) = 40° ,

then m ($\angle$ B) = m ($\angle$ C) = $\frac{180° - 40°}{2}$ = 70°



🕮 Mechanism (7) : Isosceles Triangle : Equilateral

Corollary

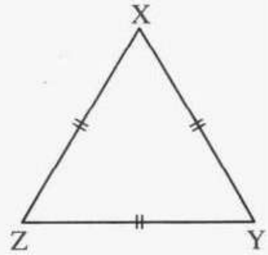
If the triangle is equilateral , then it is equiangular where each angle measure is 60°

For example :

In the opposite figure :

If XYZ is a triangle in which XY = YZ = ZX ,

then m (∠ X) = m (∠ Y) = m (∠ Z) = 60°



Mechanism (8) : To prove it is Isosceles Triangle :

Theorem (2)

If two angles of a triangle are congruent, then the two sides opposite to these two angles are congruent and the triangle is isosceles.

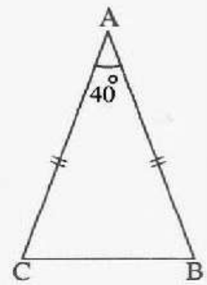
For example :

In the opposite figure :

If ABC is a triangle in which :

AB = AC , m (∠ A) = 40° ,

then m (∠ B) = m (∠ C) = $\frac{180° - 40°}{2}$ = 70°



Mechanism (9) : Equilateral Triangle :

Corollary

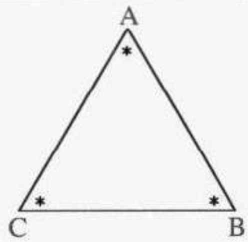
If the angles of a triangle are congruent, then the triangle is equilateral.

For example :

If ABC is a triangle in which :

∠ A ≡ ∠ B ≡ ∠ C , then AB = BC = CA

i.e. Δ ABC is an equilateral triangle.



Mechanism (10) : Isosceles Equilateral Triangle :

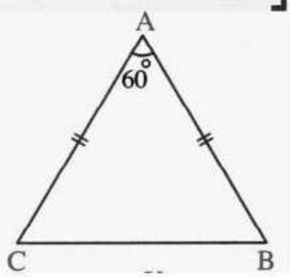
The isosceles triangle in which the measure of one of its angles = 60° is an equilateral triangle.

In the opposite figure :

If AB = AC and m (∠ A) = 60°

, then : m (∠ B) = m (∠ C) = $\frac{180° - 60°}{2}$ = 60°

∴ Δ ABC is an equilateral triangle.



- **In the opposite figure :**

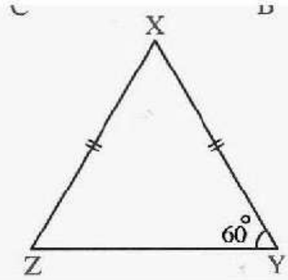
  If XY = XZ

  and m ($\angle$ Y) = 60°

  , then m ($\angle$ Z) = 60°

  , m ($\angle$ X) = 180° – (60° + 60°) = 60°

  $\therefore$ Δ XYZ is an equilateral triangle.



📖 Mechanism (11) : Isosceles Triangle : Median

Corollary (1)

The median of an isosceles triangle from the vertex angle bisects it and is perpendicular to the base.

In the opposite figure :

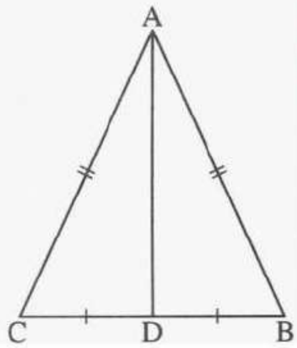
ABC is a triangle in which AB = AC and

$\overline{AD}$ is a median , then :

1 $\overrightarrow{AD}$ bisects $\angle$ BAC

i.e. m ($\angle$ BAD) = m ($\angle$ CAD)

2 $\overline{AD} \perp \overline{BC}$



📖 Mechanism (12) : Isosceles Triangle : Vertex Bisector

Corollary (2)

The bisector of the vertex angle of an isosceles triangle bisects the base and is perpendicular to it.

In the opposite figure :

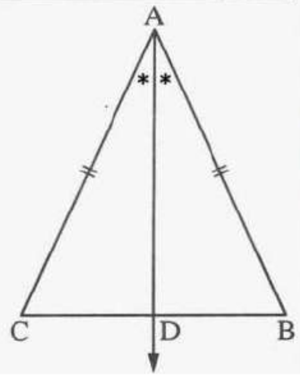
ABC is a triangle in which AB = AC and

$\overrightarrow{AD}$ bisects $\angle$ BAC , then :

1 D is the midpoint of $\overline{BC}$

i.e. BD = CD

2 $\overline{AD} \perp \overline{BC}$



📖 Mechanism (13) : Isosceles Triangle : Perpendicular

Corollary (3)

The straight line drawn passing through the vertex angle of an isosceles triangle perpendicular to the base bisects each of the base and the vertex angle.

In the opposite figure :

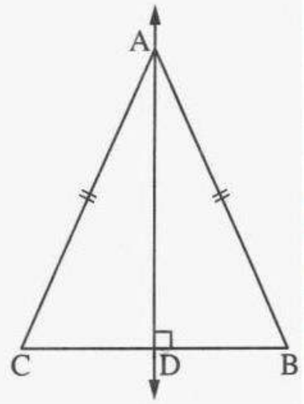
ABC is a triangle in which AB = AC and

$\overleftrightarrow{AD} \perp \overline{BC}$, then

1 D is the midpoint of $\overline{BC}$

i.e. BD = CD

2 m (∠ BAD) = m (∠ CAD)



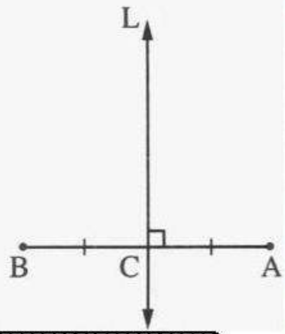
📖 Mechanism (14) : Axis of symmetry of line segment (1)

Definition

The straight line perpendicular to a line segment at its middle is called the axis of symmetry for that line segment , in brief it is known as the axis of a line segment.

In the opposite figure :

If the straight line L ⊥ $\overline{AB}$ and C ∈ the straight line L where C is the midpoint of $\overline{AB}$, then the straight line L is called the axis of $\overline{AB}$



📖 Mechanism (15) : Axis of symmetry of line segment (2)

Property

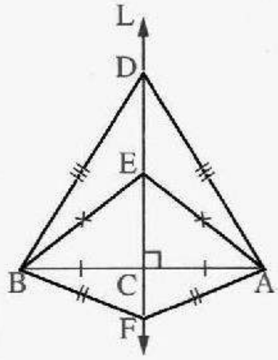
Any point on the axis of symmetry of a line segment is at equal distances from its terminals (end points).

In the opposite figure :

If the straight line L is the axis of $\overline{AB}$,

D ∈ L , E ∈ L and F ∈ L , then

DA = DB , EA = EB and FA = FB

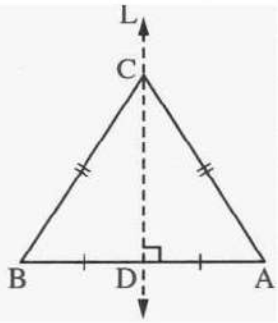


The converse of the previous property is true

i.e. If a point is at equal distances from the two terminals of a line segment , then this point lies on the axis of this line segment.

In the opposite figure :

If C is a point such that CA = CB , then the point C lies on the axis of $\overline{AB}$

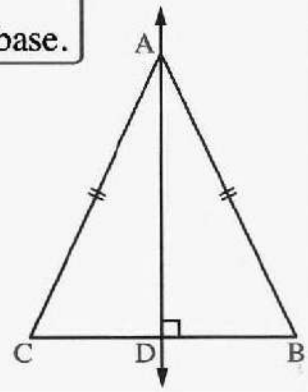


Mechanism (16) : Axis of symmetry of Isosceles Triangle :

The isosceles triangle has one axis of symmetry.
It is the straight line drawn from the vertex angle perpendicular to its base.

For example :

If ABC is an isosceles triangle where AB = AC and $\overleftrightarrow{AD} \perp \overline{BC}$, then :
$\overleftrightarrow{AD}$ is called the axis of symmetry of the isosceles triangle ABC



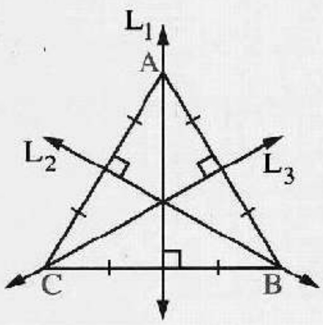
Mechanism (17) : Axis of Symmetry of Equilateral Triangle

1 The equilateral triangle has three axes of symmetry , they are the three perpendiculars drawn from its vertices to the opposite sides.

In the opposite figure :

The straight lines L_1 , L_2 and L_3 are axes of symmetry of the equilateral triangle ABC

2 The scalene triangle has no axes of symmetry.



Examples on Part (1) : Isosceles Triangle

(1) **In the opposite figure :**

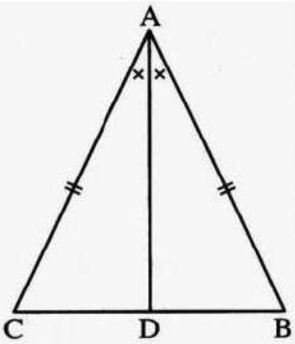
In Δ ABC :

AB = AC , $\overrightarrow{AD}$ bisects ∠ BAC

and BD = 3 cm.

Prove that : $\overline{AD} \perp \overline{BC}$

, then find the length of : $\overline{CB}$



Solution

In Δ ABC

$\because AB = AC$

$\because AD$ bisects $\angle BAC$

$\therefore AD \perp = BC$ (First Req.)

$\therefore$ D is a midpoint of BC

$\because BD = 3$ cm

$\therefore CD = BC = 3$ cm

$\therefore CB = 3 \times 2 = 6$ cm (Second Req.)

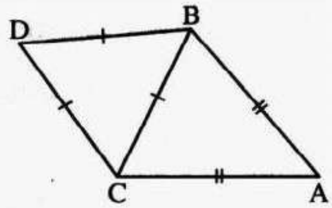
---

(2) **In the opposite figure :**

$m(\angle A) = 50°$, $AB = AC$

and Δ DBC is an equilateral.

Find : $m(\angle ABD)$



Solution

In Δ ABC

$\because AB = AC$

$\because m(\angle A) = 50°$

$\therefore m(\angle ABC) = m(\angle ACB)$

$\therefore m(\angle ABC) = (180 - 50) \div 2 = 65°$

$\because \Delta$ DBC is a equilateral

$\therefore m(\angle DBC) = 60$

$\therefore m(\angle ABD) = 65 + 60 = 125°$

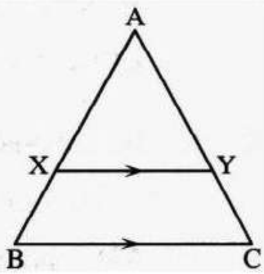
---

(3) **In the opposite figure :**

If $AB = AC$,

$\overline{XY} \parallel \overline{BC}$

Prove that : Δ AXY is an isosceles



Solution

In Δ ABC

$\because AB = AC$

$\therefore m(\angle B) = m(\angle C)$

$\because XY \parallel BC$, AC & AB are transversals

$\therefore m(\angle B) = m(\angle AXY)$ Corresponding

$\therefore m(\angle C) = m(\angle AYX)$ Corresponding

In Δ AXY

$\therefore m(\angle AXY) = m(\angle AYX)$

$\therefore AX = AY$

Δ AXY is an isosceles

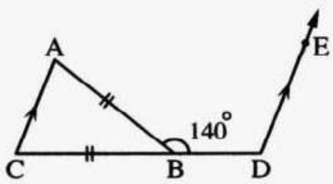
---

(4) **In the opposite figure :**

$\overline{CA} \parallel \overrightarrow{DE}$, $m(\angle ABD) = 140°$

$AB = BC$

Find : $m(\angle EDB)$



Solution

In Δ ABC

$\because AB = BC$

$\therefore$ m $\angle$A = m $\angle$C

$\because$ m$\angle$ABD = m $\angle$A + m $\angle$C (Exterior)

$\because$ m$\angle$ABD = 140°

$\therefore$ m $\angle$A = m $\angle$C = 140 ÷ 2 = 70°

$\because$ AC // DE , CD is a transversal

$\therefore$ m ($\angle$C) + m ($\angle$D) = 180 (Interior)

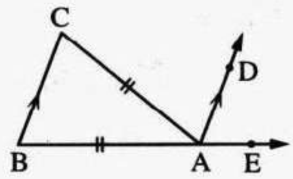
$\therefore$ m ($\angle$D) = 180 – 70 = 110

⑤ **In the opposite figure :**

AB = AC ,

$\overrightarrow{AD}$ // $\overline{BC}$

Prove that : $\overrightarrow{AD}$ bisects $\angle$ CAE



Solution

In Δ ABC

$\because$ AB = AC

$\therefore$ m $\angle$B = m $\angle$C

$\because$ AC // DE , AB & AC are transversals

$\therefore$ m $\angle$B = m $\angle$DAE (Corresponding)

$\therefore$ m $\angle$C = m $\angle$CAD (Alternate)

$\therefore$ m $\angle$DAE = m $\angle$CAD

AD bisects m $\angle$CAE

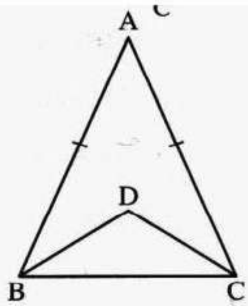
⑥ **In the opposite figure :**

ABC is a triangle in which AB = AC ,

$\overrightarrow{BD}$ bisects $\angle$ ABC , $\overrightarrow{CD}$ bisects $\angle$ ACB

Prove that :

Δ DBC is an isosceles triangle.



Solution

In Δ ABC

$\because$ AB = AC

$\therefore$ m $\angle$B = m $\angle$C

$\because$ BD bisects m $\angle$ABC

$\because$ CD bisects m $\angle$ACB

$\therefore$ m$\angle$DBC = $\frac{1}{2}$m $\angle$ABC

$\therefore$ m$\angle$DCB = $\frac{1}{2}$m $\angle$ACB

$\therefore$ m$\angle$DBC = m$\angle$DCB

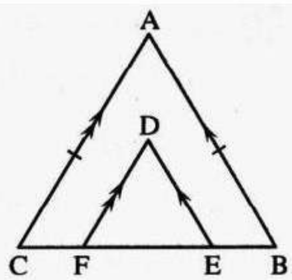
$\therefore$ Δ DBC is an isosceles

⑦ **In the opposite figure :**

AB = AC , $\overline{DE}$ // $\overline{AB}$

, $\overline{DF}$ // $\overline{AC}$

Prove that : DE = DF



Solution

In Δ ABC

$\because$ AB = AC

$\therefore$ m $\angle$B = m $\angle$C

$\because$ AC // DF , CF is a transversal

$\because$ AB // DE , EB is a transversal

$\therefore$ m $\angle$B = m $\angle$DEF (Corresponding)

$\therefore$ m $\angle$C = m $\angle$DFE (Corresponding)

$\because$ In Δ DEF

$\therefore$ m $\angle$DEF = m $\angle$DFE

$\therefore$ DE = DF

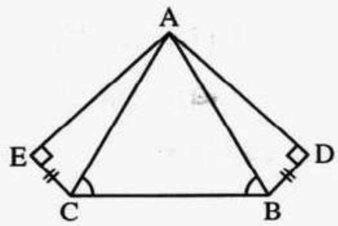
(8) **In the opposite figure :**

BD = CE

, m ($\angle$ ABC) = m ($\angle$ ACB)

, m ($\angle$ D) = m ($\angle$ E) = 90°

Prove that : m ($\angle$ DAB) = m ($\angle$ CAE)



Solution

In Δ ABC

$\because$ m $\angle$ABC = m $\angle$ACB

$\therefore$ AB = AC

In Δ Δ ABD , ACE

1) AB = AC

2) BD = CE

3) m$\angle$D = m$\angle$E = 90°

$\therefore$ Δ ABD $\equiv$ Δ ACE

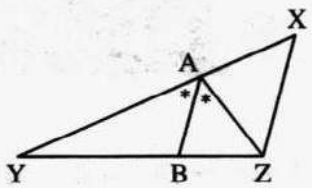
$\therefore$ m $\angle$DAB = m $\angle$ CAE

(9) **In the opposite figure :**

$\overrightarrow{AB}$ bisects angle YAZ

, $\overline{AB}$ // $\overline{XZ}$

Prove that : Δ AXZ isosceles triangle.



Solution

In Δ XYZ

$\because$ AB // XZ , AZ is a transversal

$\therefore$ m $\angle$BAZ = m $\angle$AZX (Alternate)

$\because$ AB // XZ , AX is a transversal

$\therefore$ m $\angle$X = m $\angle$BAY (Corresponding)

$\because$ AB bisects angle YAZ

$\therefore$ m $\angle$YAB = m $\angle$ZAB

$\therefore$ m $\angle$X = m $\angle$ AZX

$\therefore$ AZ = AX

Δ XYZ is isosceles triangle

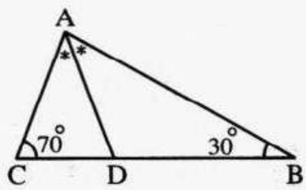
(10) **In the opposite figure :**

$\overrightarrow{AD}$ bisects $\angle$ BAC

, m ($\angle$ B) = 30°

, m ($\angle$ C) = 70°

Prove that : Δ ADC is isosceles triangle.



Solution

In Δ ABC

$\because$ m $\angle B = 30°$

$\because$ m $\angle C = 70°$

$\therefore$ m $\angle BAC = 180 - 30 - 70 = 80°$

$\because$ AD bisects angle BAC

$\therefore$ m $\angle BAD =$ m $\angle CAD = 80 \div 2 = 40°$

$\therefore$ In Δ ADC

$\therefore$ m $\angle ADC = 180 - 70 - 40 = 70°$

$\therefore$ m $\angle ADC =$ m $\angle ACD = 70°$

$\therefore$ AD = AC

Δ ADC is isosceles triangle

Part (3) : Inequality

Remember :

The measure of any exterior angle of a triangle is greater than the measure of any interior angle of the triangle except its adjacent angle.

Mechanism (18) : Comparing Angles :

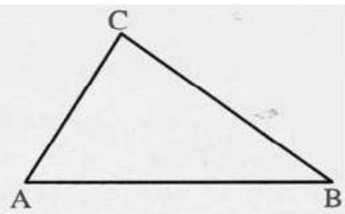
Theorem

In a triangle , if two sides have unequal lengths , the longer is opposite to the angle of the greater measure.

i.e. In ΔABC :

If AB > BC > AC , then m ($\angle$ C) > m ($\angle$ A) > m ($\angle$ B)

, m ($\angle$ C) > 60° and m ($\angle$ B) < 60°



Mechanism (19) : Comparing Sides :

Theorem

In a triangle, if two angles are unequal in measure, then the greater angle in measure is opposite to a side greater in length than that opposite to the other angle.

Mechanism (20) : Right Angled Triangle :

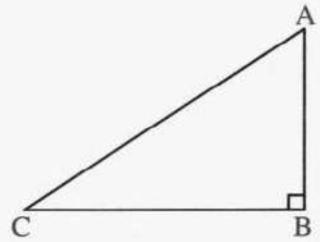
Corollary (1)

In the right-angled triangle , the hypotenuse is the longest side.

In the opposite figure :

If ΔABC is right-angled at B , then $m(\angle B) > m(\angle A)$,
$m(\angle B) > m(\angle C)$ because $\angle B$ is a right angle and each of $\angle A$ and $\angle C$ is acute so we find that :

$AC > BC$ and $AC > AB$ (according to the previous theorem).



Notice that :

In the obtuse-angled triangle, the side opposite to the obtuse angle is the longest side in the triangle.

Mechanism (21) : Perpendicular Line Segment :

Corollary (2)

The length of the perpendicular line segment drawn from a point outside a straight line to this line is shorter than any line segment drawn from this point to the given straight line.

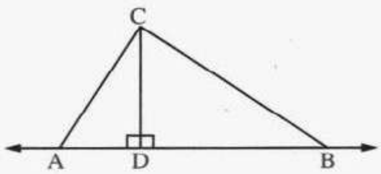
In the opposite figure :

If $C \notin \overleftrightarrow{AB}$ and $D \in \overleftrightarrow{AB}$ such that

$\overline{CD} \perp \overleftrightarrow{AB}$, then

$\overline{CB}$ is the hypotenuse in ΔCBD which is right-angled at D ,

$\overline{CA}$ is the hypotenuse in ΔCDA which is right-angled at D and so on ...



According to corollary ① , we find that

$CB > CD$, $CA > CD$ and so on ...

i.e. $CD < CB$ and $CD < CA$

Definition

The distance between any point and a given straight line is the length of the perpendicular line segment drawn from this point to the given line.

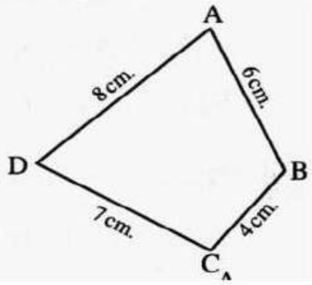
Mechanism (22) : Triangle Inequality :

In any triangle, the sum of the lengths of any two sides is greater than the length of the third side.

Problems on Part (3) : Inequality

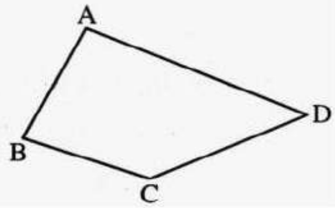
① **In the opposite figure :**

ABCD is a quadrilateral where AD = 8 cm. ,
AB = 6 cm. , CB = 4 cm. and DC = 7 cm.
Prove that : m (∠ BAD) < m (∠ BCD)



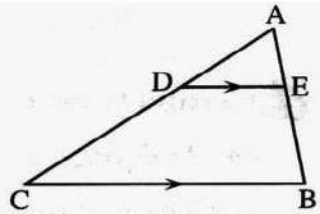
② **In the opposite figure :**

AB < AD , BC < CD
Prove that :
m (∠ ABC) > m (∠ ADC)



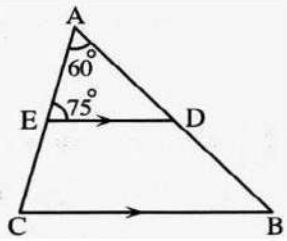
③ **In the opposite figure :**

Δ ABC in which : AC > AB , $\overline{DE} // \overline{CB}$
Prove that : AD > AE



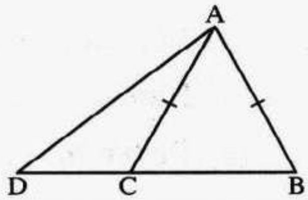
④ **In the opposite figure :**

$\overline{ED} // \overrightarrow{BC}$, m (∠ A) = 60°
and m (∠ AED) = 75°



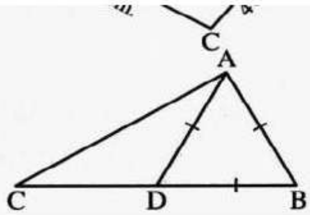
⑤ **In the opposite figure :**

If : AB = AC
Prove that :
m (∠ B) > m (∠ D)



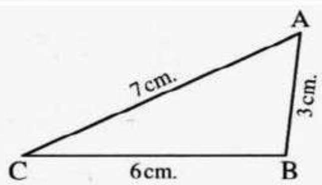
⑥ **In the opposite figure :**

ABC is a triangle , D ∈ $\overline{BC}$
, AB = AD = BD
Prove that : AC > AD



⑦ **In the opposite figure :**

Arrange the angles of Δ ABC
descendingly due to their measures

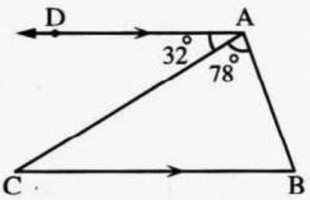


⑧ **In the opposite figure :**

$\overrightarrow{AD} \parallel \overline{BC}$, m ($\angle$ BAC) = 78°

, m ($\angle$ CAD) = 32°

Prove that : AC > AB



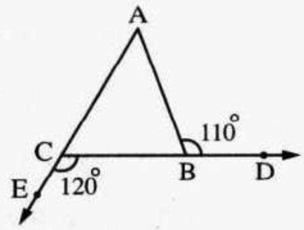
⑨ **In the opposite figure :**

ABC is a triangle , D $\in \overrightarrow{CB}$

, E $\in \overrightarrow{AC}$, m ($\angle$ ABD) = 110°

, m ($\angle$ BCE) = 120°

Prove that : AB > BC



⑩ **In the opposite figure :**

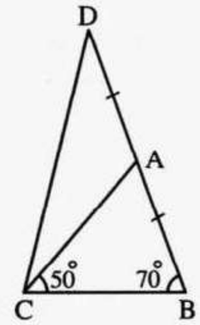
A is the midpoint of $\overline{BD}$

, m ($\angle$ ABC) = 70°

, m ($\angle$ ACB) = 50°

Prove that :

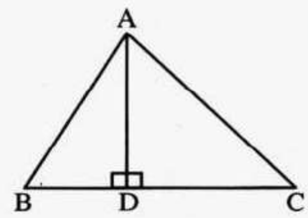
m ($\angle$ D) > m ($\angle$ DCA)



⑪ **In the opposite figure :**

Prove that :

AC + AB > 2 AD



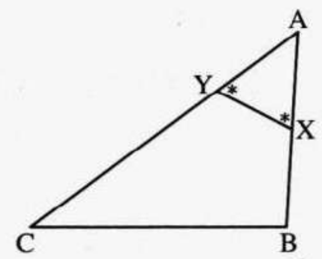
⑫ **In the opposite figure :**

ABC is a triangle in which AC > AB

, X $\in \overline{AB}$, Y $\in \overline{AC}$

where m ($\angle$ AXY) = m ($\angle$ AYX)

Prove that : YC > XB

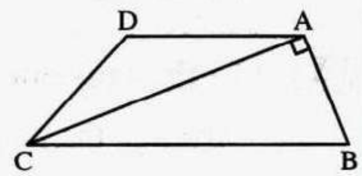


⑬ **In the opposite figure :**

$\overline{AC} \perp \overline{AB}$

, $\angle$ ADC is obtuse angle.

Prove that : CB > DC



Geom.

1-Complete

1. in the parallelogram , each two opposite sides are …….. ,……………
2. in the //gram , each two consecutive angles are ……….
3. the //gram whose diagonals are perpendicular is called ……………
4. the parallelogram whose diagonals are equal in length and perpendicular is called ………………….
5. the rhombus whose diagonals are equal in length is called ……………….
6. the rectangle whose diagonals are perpendicular is called ……………….
7. ABCD is a //gram in which m ($\angle$ B) = ………………°
8. the two diagonals of the square are …………… , ……………..
9. ABCD is a parallelogram in which m ($\angle$ A) + m ($\angle$ C) = 140 °
10. ABCD is a rectangle in which m ($\angle$ A) = 5x – 10 , then x = …………

2- Complete

1. the medians of the triangle intersect at ……………
2. the no. of medians in the right angled triangle is
3. the length of the median from the vertex of the right angle in the right angled Δ = ……………..
4. the length of the hypotenuse in thirty and sixty triangle = ………….. the length of the side opposite the angle whose measure is 30 °
5. the line segment drawn between the two midpoints of two sides in a triangle is ………………. And its length = …………………

1- complete:-

1- in the isosceles Δ if the measure of one of the two base angles 65° then the measure of its vertex angle = ………………

2- in the isosceles Δ if the vertex angle = 50 ° then the measure of one of the two base angles = …………..

3- if ABC is right angled Δ at A , AB =AC then m (∠ B) = …………..

4- in Δ XYZ if XY = XZ , then the exterior angle at the vertex Z is ………………

5- in Δ XYZ if XY = YZ = ZX , then m (∠ X) = ……………°

2- Complete

1- if two angles in the triangle are congruent then the two sides opposite these two angles are ……………… and the triangle is …………

2- If the three angles in the triangle are congruent then the triangle is ……………

3- If the isosceles Δ has angle = 45° , then the Δ is ……………

4- In Δ ABC if AC = CB and m (∠ C) m (∠ A) , then m (∠ B) = …………°

5- ABC is Δ m (∠ A) = 30 ° , m (∠ B) : m (∠ C) = 1 : 4 then Δ ABC is ……

1-Complete

1- the straight line drawn from the vertex of the isosceles Δ perpendicular to the base is called ………………..

2- the median of the isosceles Δ drawn from the vertex ……….

3- The bisector of the vertex angle of the isosceles Δ…………..

4- The st. line drawn from the vertex of an isosceles $\Delta \perp$ its base ……………

5- Any point $\in$ the axis of the line segment is ……………… from its two terminals

6- If C $\in$ the axis of symmetry of AB then ………….. = AC

7- The triangle whose angles are congruent has ………. axes of symmetry

8- In Δ ABC if m ($\angle$ A) = m ($\angle$ B) $\neq$ 60° then the no. of axes of symmetry of triangle ABC is ………………

9- If the length of each sides in the triangle = $\frac{1}{3}$ the perimeter of triangle then the no. of axes of symmetry of triangle is ………………….

10-If ABCD is a rhombus then the axis of symmetry of AC is ……………

2- Complete

1) The smallest angle of triangle (in measure) is opposite to ……………………..

2) The longest side in the right angle triangle is ……………………

3) If triangle ABC m ($\angle$A) =50° m ($\angle$B) =30°

4) If in triangle ABC m ($\angle$A) = m ($\angle$B) +m ($\angle$C) then the longest side in the triangle is ……………..

5) in the triangle ABC if m ($\angle$B) > m ($\angle$C) then ………< …………

[1] Complete :

1) The smallest angle of triangle (in measure) is opposite to ....

2) The longest side in right angled Δ is ....

3) The shortest distance between a given point and a given straight line is

....

4) In Δ ABC , m ($\angle$C) = 120° then its longest side is ....

5) In Δ ABC , if m ($\angle$A) = m ($\angle$B) + m ($\angle$C) then the longest side in the triangle

is ....

2- Complete

1) The lengths of side in Δ ....the sum of lengths of two other sides .

2) If the length of two sides in isosceles triangle are 7 cm , 4 cm then the length of the

third side = ...

3) A triangle has one axis of symmetry the lengths of two sides in it are 4 cm , 8 cm then

its perimeter = ...

4) In Δ ABC if AB = 3 cm , BC = 5 cm , AC = X cm then X $\in$ ....

Revision on geometry

Unit 4

1) Medians of triangle

1- complete:-

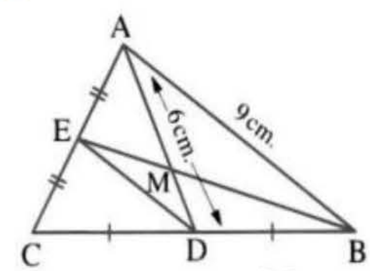
1. the medians of the triangle intersect at ……………
2. the no. of medians in the right angled triangle is
3. the length of the median from the vertex of the right angle in the right angled Δ = ……………..
4. the length of the hypotenuse in thirty and sixty triangle = ………….. the length of the side opposite the angle whose measure is 30 º
5. the line segment drawn between the two midpoints of two sides in a triangle is ………………. And its length = ………………….

In the opposite figure :

ABC is a triangle in which D is the midpoint of $\overline{BC}$, E is the midpoint of $\overline{AC}$ and $\overline{AD} \cap \overline{BE} = \{M\}$

If AD = 6 cm. and AB = BE = 9 cm. ,

calculate the perimeter of Δ MDE



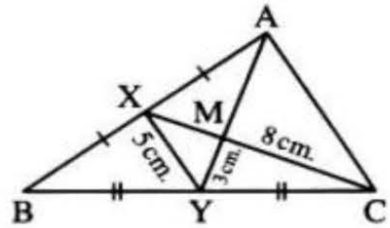
In the opposite figure :

ABC is a triangle , X is the midpoint of $\overline{AB}$

, Y is the midpoint of $\overline{BC}$, $\overline{XC} \cap \overline{AY} = \{M\}$

, XY = 5 cm. , CM = 8 cm. , YM = 3 cm.

Find the perimeter of : Δ MAC

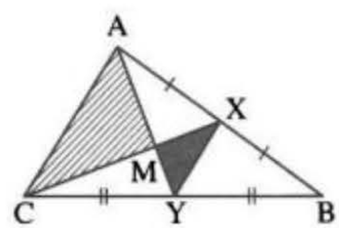


In the opposite figure :

ABC is a triangle , X is the midpoint of $\overline{AB}$,

Y is the midpoint of $\overline{BC}$, XY = 5 cm. and $\overline{XC} \cap \overline{AY} = \{M\}$

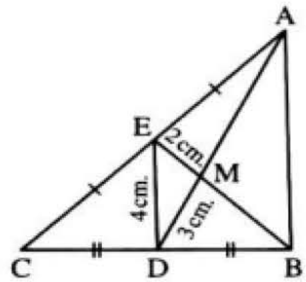
where CM = 8 cm. , YM = 3 cm. **Find :**



1 The perimeter of Δ MXY

2 The perimeter of Δ MAC

Find perimeter of $\Delta\, AMB$



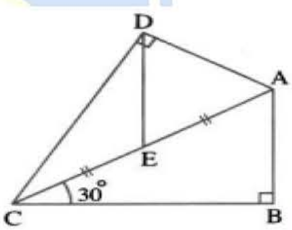
In the opposite figure :

m (∠ ABC) = m (∠ ADC) = 90° ,

m (∠ ACB) = 30° and

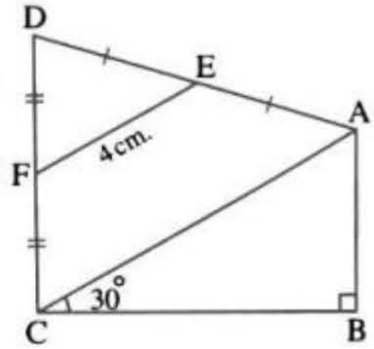
E is the midpoint of $\overline{AC}$

Prove that : AB = DE



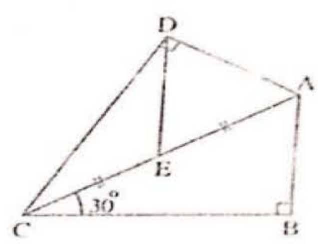
Solution

ABCD is a quadrilateral in which m ($\angle$ B) = 90° ,
E is the midpoint of $\overline{AD}$, F is the midpoint of $\overline{CD}$
m ($\angle$ ACB) = 30° and EF = 4 cm.
Find by proof the length of : $\overline{AB}$



Solution

1- In the opposite figure:
M($\angle$ ABC) = m ($\angle$ ADC) = 90°,
M($\angle$ ACB) = 30° and
E is the midpoint of $\overline{AC}$
Prove that: AB = DE



[1] Complete:

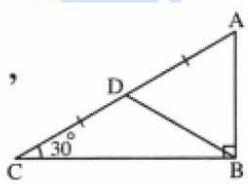
1	In the right-angled triangle the length of the median from the vertex of the right angle equal .... the length of the hypotenuse.
2	In the right-angled triangle , the length of the median from the vertex of the right angle equals ....
3	If the length of the median drawn from a vertex of a triangle equals half the length of the opposite side to this vertex in length , then ....
4	The length of the side opposite to the angle of measure 30° in the right-angled triangle equals .... the length of the hypotenuse.
5	The length of side opposite to the angle whose measure = 30° in the right-angled triangle = ...
6	The length of the hypotenuse on the right-angled triangle equals .... the length of a side opposite to the angle of measure 30°
7	In Δ LMN : If m ($\angle$ L) = 30° , m ($\angle$ N) = 60° , NM = 4 cm. , then LN = ... cm.
8	If ABC is a right-angled triangle at B , AB = 6 cm. , BC = 8 cm. , if $\overline{BD}$ is a median of triangle ABC , then BD = ... cm.
9	In Δ ABC , m ($\angle$ C) = 60° , m ($\angle$ B) = 90° , AC = 8 cm. , then BC = ... cm.

In the opposite figure :

m ($\angle$ B) = 90° , m ($\angle$ C) = 30° , $\overline{BD}$ is a median , AB = 4 cm. ,

Complete :

AC = ... cm. , BD = ... cm. , AD = ... cm.



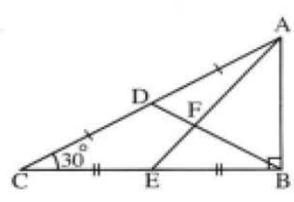
In the opposite figure :

Δ ABC in which m ($\angle$ B) = 90° , AC = 10 cm. ,

m ($\angle$ C) = 30° , EC = EB , AD = DC

Find with proof : ❶ The perimeter of Δ ABD

❷ The length of $\overline{DF}$



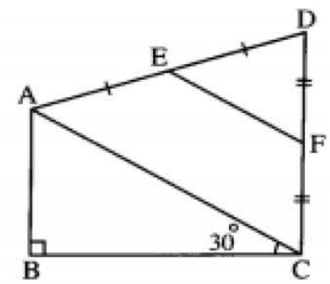
In the opposite figure :

m (∠ B) = 90° ,

m (∠ ACB) = 30° ,

E , F are midpoints of $\overline{AD}$, $\overline{DC}$

Prove that : AB = EF



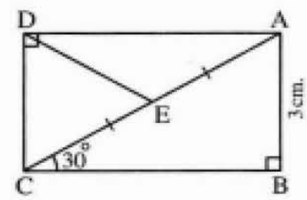
In the opposite figure :

m (∠ ABC) = m (∠ ADC) = 90° ,

m (∠ ACB) = 30° , and $\overline{DE}$ is a median of Δ ADC ,

If AB = 3 cm.

Find : The length of $\overline{DE}$



Isosceles triangle

[1] *Complete:*

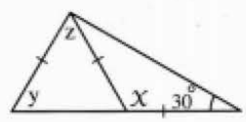
1	The two base angles in an isosceles triangle are ……….
2	Δ ABC , AB = AC , m ($\angle$ C) = 70° , then m ($\angle$ A) = ……….
3	In the Δ ABC : AB = AC , m ($\angle$ A) = 70° , then m ($\angle$ C) = ……….°
4	The Δ ABC is an isosceles and right-angled triangle if m ($\angle$ B) = 90° , then m ($\angle$ A) = m ($\angle$ C) = …………….°
5	In Δ ABC , if AB = AC and m ($\angle$ A) = 80° , then m ($\angle$ B) = m ($\angle$ …………….) = ………°
6	In Δ ABC : if AB = AC , m ($\angle$ B) = 60° , then the triangle is an ……….
7	In Δ ABC : If AB = AC and m ($\angle$ A) = 2 m ($\angle$ C) , then m ($\angle$ B) = ………. °
8	The length of side opposite to the angle whose measure = 30° in the right-angled triangle = ……….

In the opposite figure complete :

x = ……… ° ,

y = ……… ° ,

z = ……… °

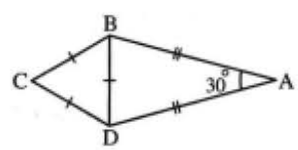


In the opposite figure :

AB = AD , m ($\angle$ A) = 30° ,

CB = BD = CD

Find : m ($\angle$ CBA)

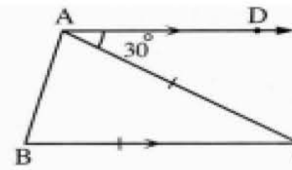


In the opposite figure :

ABC is a triangle in which : AC = BC ,

$\overline{AD} \parallel \overline{BC}$, m (∠ DAC) = 30°

Find : m (∠ ABC)

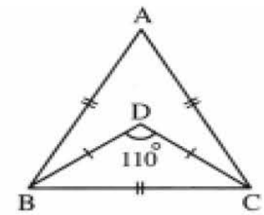


In the opposite figure :

ABC is an equilateral triangle ,

DB = DC , m (∠ D) = 110°

Find with proof : m (∠ DBC) and m (∠ DBA)



Converse of theorem of isosceles triangle

[1] *Complete:*

1	If angles of any triangle are equal in measures , then the triangle is ……….
2	If the angles of a triangle are congruent , then the triangle is …………….
3	The measure of the exterior angle of equilateral triangle = ……….°
4	If the measure of one of the angles of the right-angled triangle is 45° , then the triangle is …………….
5	In an isosceles triangle , if any angle has a measure of 60° , the triangle is ……….
6	In Δ ABC if : $\overline{AB} \perp \overline{BC}$ and AB = BC , then m ($\angle$ A) = ……….°

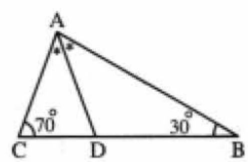
In the opposite figure :

$\overrightarrow{AD}$ bisects $\angle$ BAC

, m ($\angle$ B) = 30°

, m ($\angle$ C) = 70°

Prove that : Δ ADC is isosceles triangle.



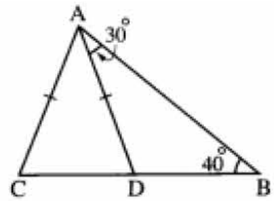
In the opposite figure :

$AD = AC$

, $m(\angle DAB) = 30°$

, $m(\angle ABD) = 40°$

Prove that : $AB = CB$



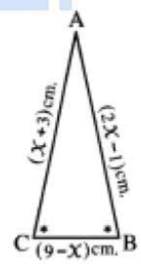
In the opposite figure :

$m(\angle B) = m(\angle C)$, $AB = (2x - 1)$ cm.

$AC = (x + 3)$ cm.

, $BC = (9 - x)$ cm.

Find with proof the perimeter of ΔABC

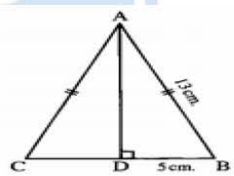


Corollaries of isosceles triangle

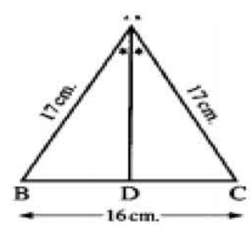
[1] Complete:

1	The ray drawn from the vertex of the isosceles triangle passing through the midpoint of the base is ....
2	The median of an isosceles triangle drawn from the vertex bisects .... and is perpendicular to ....
3	The bisector of the vertex angle of an isosceles triangle .... and ....
4	In Δ XYZ : If XY = XZ , $\overrightarrow{XL} \perp \overline{YZ}$, then $\overleftrightarrow{XL}$ bisects each of .... and ....
5	The straight line perpendicular to the midpoint of a line segment is called ....
6	In the isosceles triangle if the measure of any angle is 60° , then the number of axis of symmetry ....
7	The number of axes of symmetry of the isosceles triangle equal ....
8	The number of symmetrical line in an scalene triangle = ...

In the opposite figure :
In Δ ABC , AB = AC ,
$\overline{AD} \perp \overline{BC}$,
AB = 13 cm. and BD = 5 cm.
Find : ❶ The length of $\overline{BC}$
❷ The area of Δ ABC



In the opposite figure :
$\overrightarrow{AD}$ bisects $\angle$ BAC ,
AB = AC = 17 cm. ,
and BC = 16 cm.
Prove that : m ($\angle$ ADB) = 90° ,
then find the length of : $\overline{AD}$ and the area of Δ ABC



Inequality

1-Complete

1) The smallest angle of triangle (in measure) is opposite to ……………………..

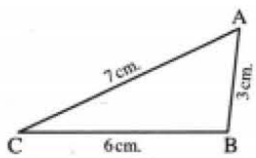
2) The longest side in the right angle triangle is …………………….

3) If triangle ABC m ($\angle$A) =50° m ($\angle$B) =30°

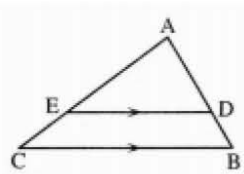
4) If in triangle ABC m ($\angle$A) = m ($\angle$B) +m ($\angle$C) then the longest side in the triangle is ……………..

5) in the triangle ABC if m ($\angle$B) > m ($\angle$C) then ……….< …………

In the opposite figure :
Arrange the angles of Δ ABC descendingly due to their measures



In the opposite figure :
$\overline{ED} \parallel \overline{BC}$,
AC > AB
Prove that : AE > AD



[1] Choose the correct answer:

1	In Δ ABC , AB > AC , then m ($\angle$ C) ………. m ($\angle$ B) (a) < (b) > (c) = (d) ≤
2	In Δ ABC if AB > AC , then m ($\angle$ B) …………… m ($\angle$ C) (a) > (b) < (c) = (d) ≥
3	In Δ ABC , AB > AC , m ($\angle$ C) = 70° , then m ($\angle$ B) may be ………. (a) 70° (b) 50° (c) 80° (d) 75°

4	In Δ ABC : If BC > AB , then m ($\angle$ A) ………. m ($\angle$ C) (a) = (b) < (c) ≤ (d) >
5	In the triangle XYZ , if XY > ZX , then m ($\angle$ Y) ………. m ($\angle$ Z) (a) > (b) < (c) = (d) ≥
6	In Δ ABC : AB = AC , m ($\angle$ B) = 65° , then : AC ………. BC (a) < (b) > (c) = (d) ≤

In Δ ABC if : AB = 14 cm. , BC = 6 cm. and AC = 10 cm. Arrange the angles of Δ ABC ascendingly due to their measures.

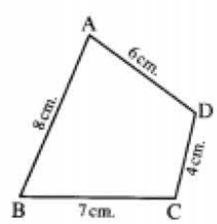
In the opposite figure :

AB = 8 cm. ,

BC = 7 cm. ,

CD = 4 cm. , AD = 6 cm.

Prove that : m ($\angle$ BCD) > m ($\angle$ BAD)



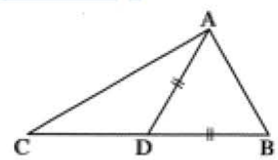
[1] Choose the correct answer:

1	Δ XYZ , m ($\angle$ X) = 60° , m ($\angle$ Y) = 40° , then XZ .... XY (a) < (b) > (c) = (d) nothing.
2	ABC is a triangle in which : m ($\angle$ B) = 70° , m ($\angle$ C) = 50° , then AC .... AB (a) > (b) < (c) = (d) ≡
3	In a triangle ABC : m ($\angle$ B) = 75° , m ($\angle$ C) = 50° , then BC .... AB (a) < (b) > (c) = (d) ≡
4	ABC is a triangle in which : m ($\angle$ B) = 80° , m ($\angle$ C) = 50° , then BC .... AB (a) > (b) < (c) = (d) ≡
5	If : m ($\angle$ A) = 50° and m ($\angle$ B) = 60° in triangle ABC then AB ....AC (a) > (b) < (c) = (d) ≤

In the opposite figure :

ABC is a triangle and D $\in \overline{BC}$ where BD = AD

Prove that : BC > AC

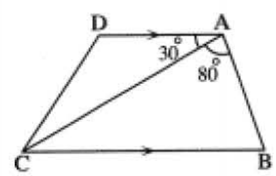


In the opposite figure :

$\overrightarrow{AD}$ // $\overline{BC}$, m ($\angle$ BAC) = 80° and m ($\angle$ DAC) = 30°

Prove that :

BC > AB



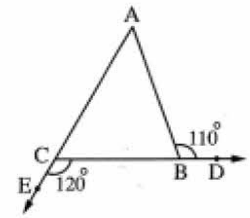
In the opposite figure :

ABC is a triangle , $D \in \overrightarrow{CB}$,

$E \in \overrightarrow{AC}$, m ($\angle$ ABD) = 110°

and m ($\angle$ BCE) = 120°

Prove that : AB > BC

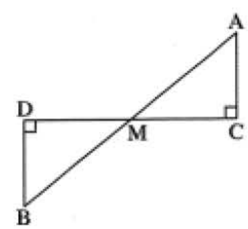


In the opposite figure :

$\overline{AB} \cap \overline{CD} = \{M\}$, $\overline{AC} \perp \overline{CD}$ and $\overline{BD} \perp \overline{CD}$

Prove that :

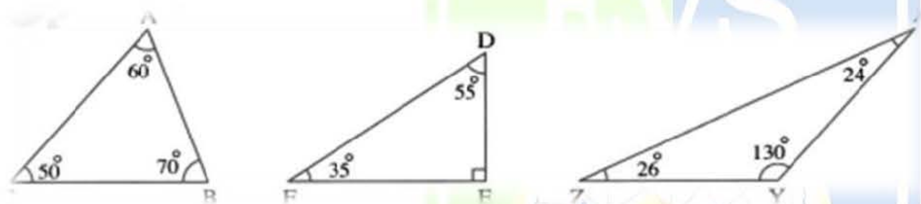
AB > CD



[1] Complete :

1) The lengths of side in Δ ……………..the sum of lengths of two other sides .
2) If the length of two sides in isosceles triangle are 7 cm , 4 cm then the length of the third side = …………………..
3) A triangle has one axis of symmetry the lengths of two sides in it are 4 cm , 8 cm then its perimeter = ……………….
4) In Δ ABC if AB = 3 cm , BC = 5 cm , AC = X cm then $X \in$ ……………..

Arrange the lengths of sides of the following triangles ascending



Final Revision Geometry Prep2

[1] Complete:

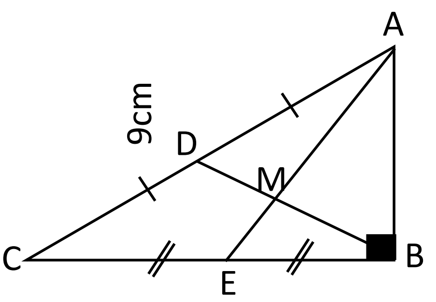
1) The length of the median drawn from the vertex of the right angle in the right - angled triangle .... the length of the hypotenuse
2) The number of axes of symmetry of the equilateral triangle is …….
3) The medians of the triangle intersect at ………
4) The sum of lengths of any two sides in any triangle ….. the length of the third side
5) the measure of an angle of the isosceles triangle is100 , then the measure of one of the other angles =……..
6) The axis of symmetry of the line segment is …….
7) The two base angles of the isosceles triangle are …….
8) The measure of the exterior angle of the equilateral triangle = ……..
9) If the lengths of two sides in the triangle are not equal, then the greater side in length is opposite to…….
10) The sum of measure of any two consecutive angles in the parallelogram =…
11) The median of an isosceles triangle drawn from the vertex bisects ……… and is perpendicular to ……
12) The isosceles triangle has …… axis of symmetry.
13) The length of the side opposite the angle of measure 30 in the right-angled triangle ………. the length of the hypotenuse.
14) The longest side in the right-angled triangle is ………
15) ABC is a triangle in which AB = AC , m(∠ A) 50 ,then m(∠B) ....
16) ABC is a triangle in which AB > BC > AC , then the smallest angle in measure of it is ………
17) The point of intersection of the medians of any triangle divides each of them with the ratio ……from the base.
18) If the point A ∈ the axis of symmetry of BC , then AB = ...
19) ABC is a triangle in which AB =4 cm , BC = 5 cm. then AC ∈]..... , ...[
20) If AD is a median in ABC , M is the point of intersection of the medians of it , then AD = ... AM
21) If the lengths of two sides in a triangle are not equal, then the greater side in length is opposite ……
22) The two base angles of the isosceles triangle are………
23) If ABC is a right - angled at B and AB = $\frac{1}{2}$ AC , then m(A) ....
24) If the lengths of two sides in the isosceles triangles triangle are 5 cm and 10 cm , then the length of the third side = ……. Cm.
25) Each two opposite angles in the parallelogram are……….
26) The triangle which has no axis of symmetry is ……triangle.
27) If AD is a median of ABC , M is the point of intersection of the median of ABC , then AM= .... AD

28) In the isosceles triangle if the measure of one of the two base angle 50 , then the measure of the vertex angle .....
29) The axis of symmetry of a line segment is the straight line which is ……….
30) In ΔABC , if m(∠ B) =70 and m(∠ C)= 50 , then : AB .... AC
31) In the parallelogram , the two diagonals are …….
32) If x cm , 4 cm and 5 cm. are lengths of the sides of a triangle , then $\ldots < x < \ldots$
33) The longest side in the right-angled triangle is …….
34) The bisector of the vertex angle of the isosceles triangle is ………
35) Any point on the axis of symmetry of a line segment is ………..
36) The length of the side opposite the angle whose measure 30 in the right – angled triangle equals ....
37) If ABC has one axes of symmetry and m(∠ABC) 120 , then m(∠A)= ....
38) In ABC if m(∠A) =30 and m(∠B) =90 , then AC =......
(BC or 2 BC or 2 AB or BC)
39) If ABC is right - angled at B , then AB .... AC
40) If 3 cm and 7 cm are two lengths of two sides in a triangle , then the greatest integer representing the length of the third side is ……. Cm
41) The length of the median drawn from the vertex of the right angle of the right-angled triangle equals ……...
42) The perpendicular bisector of a line segment is called ……….
43) The point of intersection of the medians of the triangle bisects each of them with the ratio ….. : ….. From the base
44) If the lengths of two sides of a triangle are not equal, then the greater side in length is opposite ……..
45) If the length of the median of a triangle drawn from a vertex is equal to the half length of the opposite side , then the angle of this vertex is ……..
46) If the lengths of two sides of an isosceles triangle are 11 cm and 5 cm , then the length of the third side is………
47) The number of axes of symmetry of the triangle in which the measure of two angles are 60 and 70 equals ....
48) The length of the hypotenuse of the right-angled triangle = …….. the length of the median drawn from the vertex of the right angle.
49) In Δ ABC if m($\angle B$) - m(∠A) > m(∠C) , then AC .... AB
50) If the lengths of two sides of a triangle are not equal , then the greater in length is opposite ……..
51) The bisector of the vertex angle of the isosceles triangle ……..
52) If the length of any side of a triangle = $\frac{1}{3}$ the perimeter of the triangle , then the number of axes of symmetry of the triangle is ......
53) If the lengths of two sides of a triangle are 5 cm and7 cm , then the length of the third side] ..... , ... [
54) In the parallelogram , the two diagonals ……..
55) If ABC has one axis of symmetry and m(∠B) =120, then m(∠ A) ....

56) The point of the intersection of the medians of the triangle divides each of them with ratio ….. from the vertex.
57) In Δ ABC , AB□ + BC □- AC> ......
58) The bisector of the vertex angle of the isosceles triangle ……….
59) If in ABC : AB= AC and m(∠ A) =2 m(∠B) , then m(∠C) ....
60) The isosceles triangle in which the measure of one of its angles is 60 , has .... axes of symmetry.
61) If the lengths of two sides of a triangle are not equal then the longer side is opposite an angle ……. Than the measure of the angle opposite the other
62) An isosceles triangle , one of its base angles has measure 70 then the measure of the vertex angle is …….
63) An isosceles triangle the lengths of two sides of it are 4 cm and 9 cm then the length of the third side = …….. cm.
64) In Δ XYZ : m(∠Y) = 110, then the longer side is ......
65) In Δ ABC : m(∠A) = 55 , m(∠B) = 70 , then the number of axes of symmetry of the triangle is ......
66) the point of intersection of the medians of the triangle divides each of them with the ratio 1 : 2 from ……..
67) The median which is drawn from the vertex of an isosceles triangle bisects ……… and it is ……. to the base.
68) ABC is right - angled at B , AB = 3 cm , BC = 4 cm if BD is a median of ABC then BD .... cm.
69) Δ ABC is right - angled at B then AC ...... BC
70) If Δ ABC ≡ Δ XYZ , then AC = ...
71) If the measure of one of the angles of an isosceles triangle is 60 then the triangle is .....
72) The bisector of the vertex angle of the isosceles triangle bisects the base and it is …….
73) If the measure of one angle of the two base angles of the isosceles triangle 75 , then the measure of the vertex angle .....
74) The measure of the exterior angle of the equilateral triangle = …….
75) If Δ ABC is an obtuse - angled triangle at C then AB .... AC
76) The perpendicular bisector of a line segment is called ……….
77) In the parallelogram each two opposite sides are …..

---

1) ABC is a triangle in which m (∠B)= 90^0
m (∠ C)= 30^0, AC=9cm
$\overline{AE}$, $\overline{BD}$ are two medians
Intersecting at M, find the length
Of $\overline{BD}$, $\overline{BM}$, $\overline{AB}$

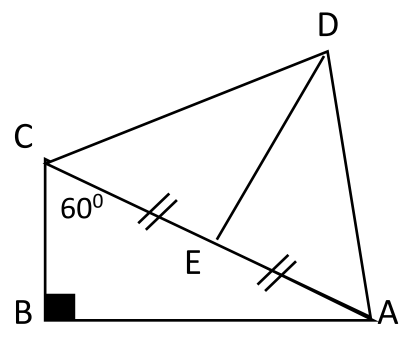


2) ABC is a right angled Δ at B,

m ($\angle$ ACB)= 600, E is midpoint

of $\overline{AC}$ and DE = BC

Prove that: m ($\angle$ADC) = 90^0



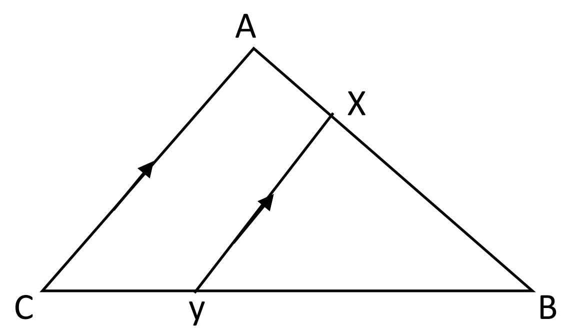
3) In the opposite figure:

AB = BC , X $\in$ $\overline{AB}$ and Y $\in$ $\overline{BC}$

Such that: $\overline{XY}$ // $\overline{AC}$

Prove that:

m ($\angle$BXY) = m ($\angle$BYX)

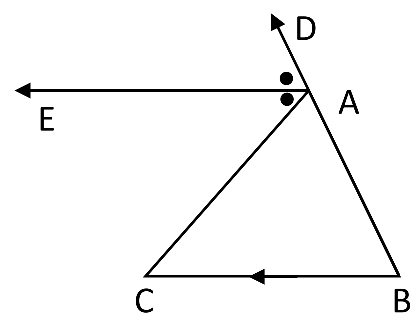


4) In the opposite figure:

A $\in$ $\overrightarrow{BD}$, $\overrightarrow{AE}$ // $\overrightarrow{BC}$

and $\overrightarrow{AE}$ bisects $\angle$ CAD

Prove that: AB = AC

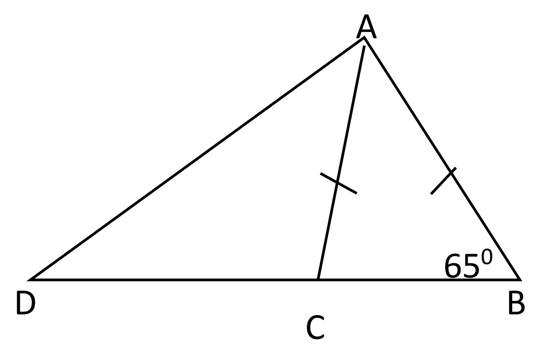


5) In the opposite figure:

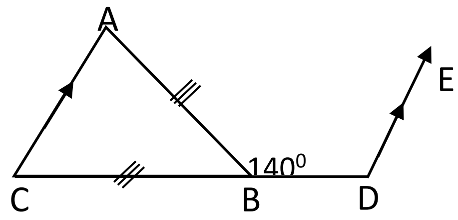
AB = AC = CD and m ($\angle$B) = 650

Find by proof:

m ($\angle$BAD)



6) In the opposite figure:

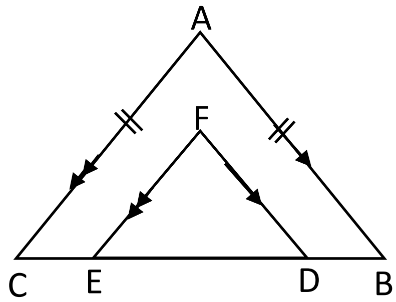


$\overrightarrow{DE}$ // $\overline{AC}$, AB = BC

and m (∠ABD) = 1400

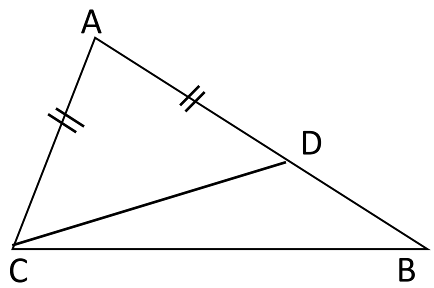
find m (∠EDB)

7) D ∈ $\overline{BC}$, E ∈ $\overline{BC}$, $\overline{AB}$ // $\overline{FD}$ and $\overline{AC}$ // $\overline{FE}$ if AB = AC



Prove that: FDE is an isosceles triangle.

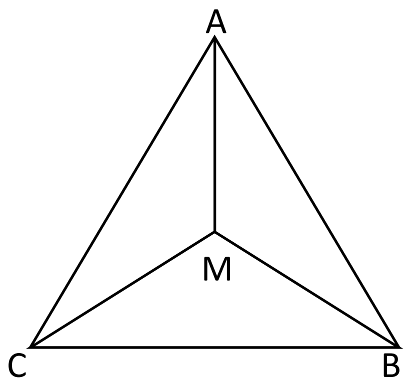
8) In the opposite figure:



D ∈ $\overline{AB}$ where AD = AC

Prove that: m (∠ACB) > m (∠B)

9) In the opposite figure:



ABC is a triangle in which M is

A point inside it, **prove that:**

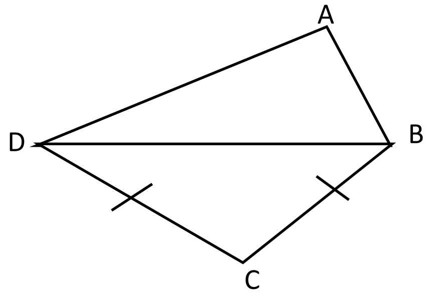
m(∠AMC) > m(∠ABC)

10) **<u>In the opposite figure</u>**:

$ABCD$ is a quadrilateral in which

$AD > AB$ and $BC = CD$

Prove that: $m\ (\angle ABC) > m\ (\angle ADC)$



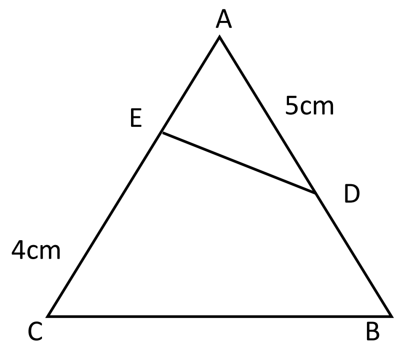
11) **<u>In the opposite figure</u>**:

ABC is a triangle in which

$AB = AC$ and $DB > DC$

Prove that:

$m\ (\angle ABD) > m\ (\angle ACD)$

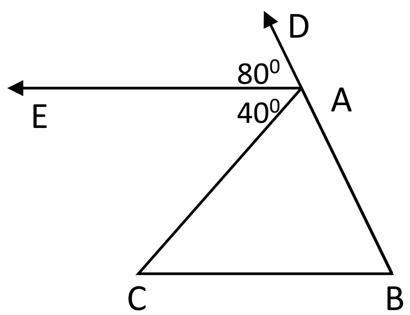


12) **<u>In the opposite figure</u>**:

$\overrightarrow{AE}\ //\ \overline{BC}$, $m\ (\angle DAE) = 80^0$

and $m\ (\angle EAC) = 40^0$

Prove that: $AC > AB$

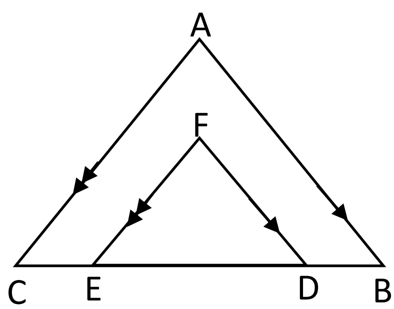


13) **<u>In the opposite figure</u>**:

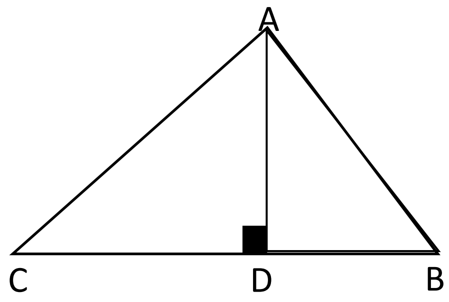
$\overline{AB}\ //\ \overline{DF}$, $\overline{AC}\ //\ \overline{EF}$

$AC > AB$

Prove that: $FE > DF$



14) **In the opposite figure**:

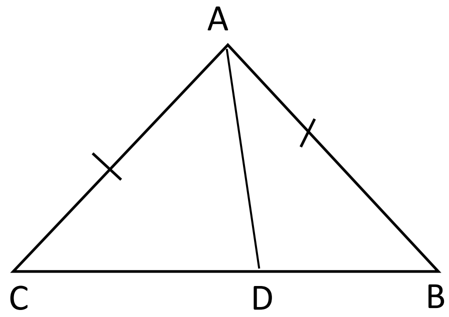


ABC is a triangle in which

$AC > AB$, $\overline{AD} \perp \overline{BC}$

Prove that: $m(\angle BAD) < m(\angle CAD)$

15) **In the opposite figure**:



ABC is a triangle in which

$AB = AC$, D $\in \overline{BC}$

Prove that: $AB > AD$